

**Amendments to the claims:**

Claims 1 - 10 have been canceled. Claims 11-13 and 16-17 have been amended. Claims 19-22 are new. Claims 11-22 are pending.

**Listing of the claims:**

1. (Cancelled).
2. (Cancelled).
3. (Cancelled).
4. (Cancelled).
5. (Cancelled).
6. (Cancelled).
7. (Cancelled).
8. (Cancelled).
9. (Cancelled).
10. (Cancelled).
11. (Currently Amended) A method of reducing total emissions of a turbo-charged diesel engine having an engine crankcase and an exhaust tailpipe; the total emissions including particulate matter emissions from the engine crankcase added to the particulate matter emissions from the exhaust tailpipe; the method comprising:
  - (a) running the engine to produce crankcase blow-by gases and an exhaust stream;
  - (b) filtering the blow-by gases and directing filtered blow-by gases back into the engine crankcase; and

- (c) treating the exhaust stream with a catalyst;  
wherein the total emissions are reduced by 25% or greater when compared to the same engine that does not filter the blow-by gases and that does not treat the exhaust stream with a catalyst.
- 12. (Currently Amended) A method according to claim 11 wherein:
  - (a) said step of running the engine includes using low sulfur ~~density~~diesel fuel or ultra sulfur ~~density~~diesel fuel.
- 13. (Currently Amended) A method according to claim 11 wherein:
  - (a) said step of running the engine includes using ultra low sulfur ~~density~~diesel fuel;  
and  
wherein total emissions are reduced by 25-50% when compared to the same engine that does not filter the blow-by gases and that does not treat the exhaust stream with a catalyst.
- 14. (Previously Presented) A method according to claim 11 wherein:
  - (a) the step of filtering the blow-by gases includes directing the blow-by gases through a coalescer filter to coalesce the gases into liquid; and then, from the coalescer filter through a barrier filter to remove at least some particulate material.
- 15. (Previously Presented) A method according to claim 11 wherein:
  - (a) the step of treating includes directing the exhaust stream through a honeycomb structure coated with a catalyst.
- 16. (Currently Amended) A kit for reducing ~~engine~~-total emissions from an existing diesel engine; the kit comprising:
  - (a) a blow-by filter including:
    - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;

- (ii) a second stage filter comprising a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
    - (iii) a first stage coalescer filter oriented in extension across the gas stream inlet aperture;
    - (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter being unitary in construction;
    - (v) said first stage coalescer filter including a nonwoven fibrous bundle having a first upstream surface area; said second stage filter including pleated media having a second upstream surface area; and
    - (vi) the first upstream surface area being no more than 10% of the second upstream surface area; and
  - (b) a catalytic converter muffler comprising a catalytic converter honeycomb structure with a catalyst coating and sound pressure reduction structure.
17. (Currently Amended) In ~~an existing system having a turbo-charged diesel engine having an engine crankcase with~~ blow-by vent structure and exhaust port structure, a method comprising:
- (a) installing a blow-by filter in gas-flow communication with the engine ~~crankcase~~ blow-by vent structure; and
  - (b) installing a catalytic converter muffler arrangement comprising a catalytic converter honeycomb structure with a catalyst coating in gas-flow communication with the engine ~~crankcase~~ exhaust port structure.
18. (Previously Presented) A method according to claim 17 wherein:
- (a) said step of installing a blow-by filter includes installing a blow-by filter including:
    - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;

- (ii) a second stage filter comprising a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
- (iii) a first stage coalescer filter oriented in extension across the gas stream inlet aperture;
- (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter being unitary in construction;
- (v) the first stage coalescer filter including a nonwoven fibrous bundle having a first upstream surface area; the second stage filter including pleated media having a second upstream surface area; and
- (vi) the first upstream surface area being no more than 10% of the second upstream surface area.

19. (New) An emissions reduction retrofit kit for existing on-highway diesel engines that were certified at the time of manufacture under emissions regulations in place between 1991 and 2003 and were rated to produce between 150 and 600 horsepower, the kit comprising:

- (a) a blow-by filter including:
  - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;
  - (ii) a second stage filter comprising a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
  - (iii) a first stage coalescer filter oriented in extension across the gas stream inlet aperture;
  - (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter being unitary in construction;

- (v) said first stage coalescer filter including a nonwoven fibrous bundle having a first upstream surface area; said second stage filter including pleated media having a second upstream surface area; and
- (vi) the first upstream surface area being no more than 10% of the second upstream surface area; and
- (b) a catalytic converter.

20. (New) A method for reducing emissions from existing on-highway diesel engines certified under emissions regulations in place between 1991 and 2003 and rated to produce between 150 and 600 horsepower, the method comprising

- (a) installing a blow-by filter in gas-flow communication with the engine blow-by vent structure and in further gas-flow communication with the engine air intake structure; and
- (b) installing a catalytic converter in gas-flow communication with the engine exhaust port structure.

21. (New) A method according to claim 20 wherein:

- (a) said step of installing a blow-by filter includes installing a blow-by filter including:
  - (i) a first end cap and a second end cap; the first end cap including a central gas stream inlet aperture;
  - (ii) a second stage filter comprising a tubular construction of pleated media extending between the first end cap and the second end cap; the tubular construction of media defining an open tubular interior; the central gas stream inlet aperture of the first end cap being in flow communication with the open tubular interior;
  - (iii) a first stage coalescer filter oriented in extension across the gas stream inlet aperture;
  - (iv) the pleated media of the second stage filter, the first end cap, the second end cap, and the first stage coalescer filter being unitary in construction;

- (v) the first stage coalescer filter including a nonwoven fibrous bundle having a first upstream surface area; the second stage filter including pleated media having a second upstream surface area; and
- (vi) the first upstream surface area being no more than 10% of the second upstream surface area.

22. (New) A method for certifying a diesel engine emissions control retrofit system to comply with a California Air Resources Board (“CARB”) tailpipe particulate matter (“PM”) reduction requirement of greater than or equal to 25%, the method comprising:

measuring the untreated crankcase by-blow particulate matter emissions of an existing diesel engine, defined as PM(c1);

measuring the untreated tailpipe particulate matter emissions of an existing diesel engine, defined as PM(t1);

providing a crankcase blow-by filtration system that filters the crankcase blow-by gas and routes the filtered gas to the engine intake;

providing a diesel oxidation catalyst in the exhaust stream;

measuring the treated tailpipe particulate matter emissions of the existing diesel engine with the crankcase blow-by filtration system and the diesel oxidation catalyst, defined as PM(t2); and

calculating the tailpipe particulate matter emissions reduction efficacy percentage as

$$\frac{[(PM(c1) + PM(t1)) - PM(t2)] * 100}{PM(c1) + PM(t1)}$$